THE TOTAL USE OF URBAN SPACE

by

NICOLAS M. MANASSEH H.
Architecture Degree, Universidad Catolica de Chile
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Signature of Author _____
Department of Architecture

Certified by _____
Thesis Supervisor

Accepted by _____
Chairman, Department of Architecture

June, 1966

Dean Lawrence B. Anderson
School of Architecture and City Planning
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dean Anderson:

This thesis "The Total Use of Urban Space" is submitted in partial fulfillment of the requirements for the degree of Master of Architecture.

Respectfully,

Nicolas M. Manasseh

ABSTRACT

The main interest of the author in this thesis is the procedure in which an architectural investigation can be made starting from the theory, proceeding to general conclusions, assumptions, test case, evaluation, and finally revision of the theory.

This thesis is an attempt to analyze the ever-growing problem of the second half of the 20th century as far as urban design is concerned, mainly the total use of urban space.

The general objective is to break the problem into its most basic architectural components and then after stating general conclusions and assumptions, to study them with respect to each other in a test case.

This written work is only the first part of the thesis: it is the result of the breaking of the urban components into workable architectural categories. A special effort has been made to eliminate from it the purely philosophical arguments that led to these results, and to have it stated in the most specific, tangible, and simple architectural terms.

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TABLE OF CONTENTS

DEFINITION OF TERMS

It was found necessary to define six basic terms to be used throughout the thesis as constants around which all the notions will revolve.

1. Activity - Any human function: social, economic, recreational, etc.
2. Element - Object within an environment where an activity takes place: Symphony Hall, Filene's, swimming pool.
3. Environment - The context where an activity occurs: cultural center, shopping center, park.
4. Spaces - The voids contained by the elements or between the elements: Auditorium, mezzanine.
5. Shapes - Physical qualities, dimensions of elements independent of the environment.
6. Forms - Physical qualities of elements in their environment.

INTRODUCTION

Our urban society is characterized by evolutionary, heterogeneous, and conflicting institutions and individuals in existence which are involved in social, economic, or political activities. This is reflected in physical form, in that our cities, whose main function is to expedite the interaction of these activities, are still a combination of small individual forms and spaces (three dimensional) standing on quasi related and articulated larger places or locations (two dimensional).

The urban designer's aim is the design of urban spaces created by the integration of the extremely large number of the above mentioned conflicting individual elements of our urban structure into one total physical form, and unless we consider the urban space available for this end three dimensional, we shall fall short of our aim. An analysis of our actual urban design science will reveal that one of the most important drawbacks is that we still consider the urban space as being a surface, mainly the ground level, and that both the allocation and design of any element on it still corresponds to this two dimensionality. The allocation is carried out on this plane according to what we call zoning theories and the design, no matter how high the element is, is an endless repetition in three dimensions of these two dimensional theories.

This concept of the surface of the earth being the urban space is a restriction upon urban design. Unless we learn to think of "urban space" as being the ground, the air, and the under ground where our cities are, we will not use all our urban space resources, now that technically almost everything is feasible, and we will go

on building separate buildings standing on separate sites, and competing individually for air, sun, view, sky, etc.

The total use of urban space is by no means a new concept. Many proposed as well as executed project in the past can be considered as attempts to solve some aspect of the problem, yet none of them considers the problem as such, or tries to solve it for its totality. These projects are generally referred to as "air-right projects." The Hanging Gardens of Babylon, the Ponte Vecchio, the Pan American Building in New York, and our subways and multi-level highways are only a few of the executed examples; while Le Corbusier's solution for Rio de Janeiro and Yona Friedman's as well as Kenzo Tange's schemes for cities stand out as the best utopian proposals.

To claim that one could solve the problem of the three dimensional allocation of activities in its totality would be a complete deception. Architects and planners have had trouble enough trying to study relationships and to set rules or zoning codes for the two dimensional allocation of space and activities. There is no such thing as a universal solution. That is why we have all kinds of conflicting schemes from Soria y Matia's "Ciudad Lineal" to Le Corbusier's "Ville Radieuse" to Bardet's and Auzelle's "Nouveau Urbanism."

For all the many examples of "air right" schemes proposed and built, almost nothing has been done in terms of research to find the basic components of the problem, the relation between these components, and how to order them in the urban space.

The aim here then is not to set rigid rules or schemes or to make "master plans" - all these can sometimes be more of a drawback

than a rule. The most we can aim for then is to break the problem into its smallest parts and then set general goals and objectives for putting these parts together when necessary in a meaningful way. Then the general objective we have accepted "a priori" as being the main concern of urban design will be fulfilled, i.e.: Urban design is mainly concerned with the design of urban spaces created by the integration of the extremely large numbers of conflicting individual elements in our urban structure into one total, intrarelated, ordered and articulated urban form.

CHAPTER I

PART I: AIR RIGHTS

Every element of the urban structure affects and is influenced by certain physical space above, under, and/or adjacent to it. The quality of this space affects how well the elements fulfill their functions. We call this space the air right of the element.

One need only compare the Piazza San Marco, where the elements form and yet are enhanced by the space they share, to the Piazza Prudential, the sterile gesture that lies at the foot of a very tall box, weakly fenced by arcades, to see the proper and the insensitive use of air rights.

The air right of an element then is the definition of the minimal qualities and dimensions of space required for that element to function efficiently and esthetically.

There is an air right problem when those qualities and dimensions are infringed upon. It is the purpose of this chapter to try to classify all the kinds of air right problems into very definite and workable categories.

Undoubtedly, the conditions of the mentioned air-right spaces are dictated by the character of the activities the elements involve. While a warehouse, for example, requires no more space than the physical dimension necessary for storage, a park needs more uninterrupted space over it than the height of its trees to be a leisure element. What we would like to have is some way to distinguish between these different kinds.

For this end I have synthesized air rights into two basic

categories. Quantitative, or functional air rights, and qualitative, or spatial air rights.

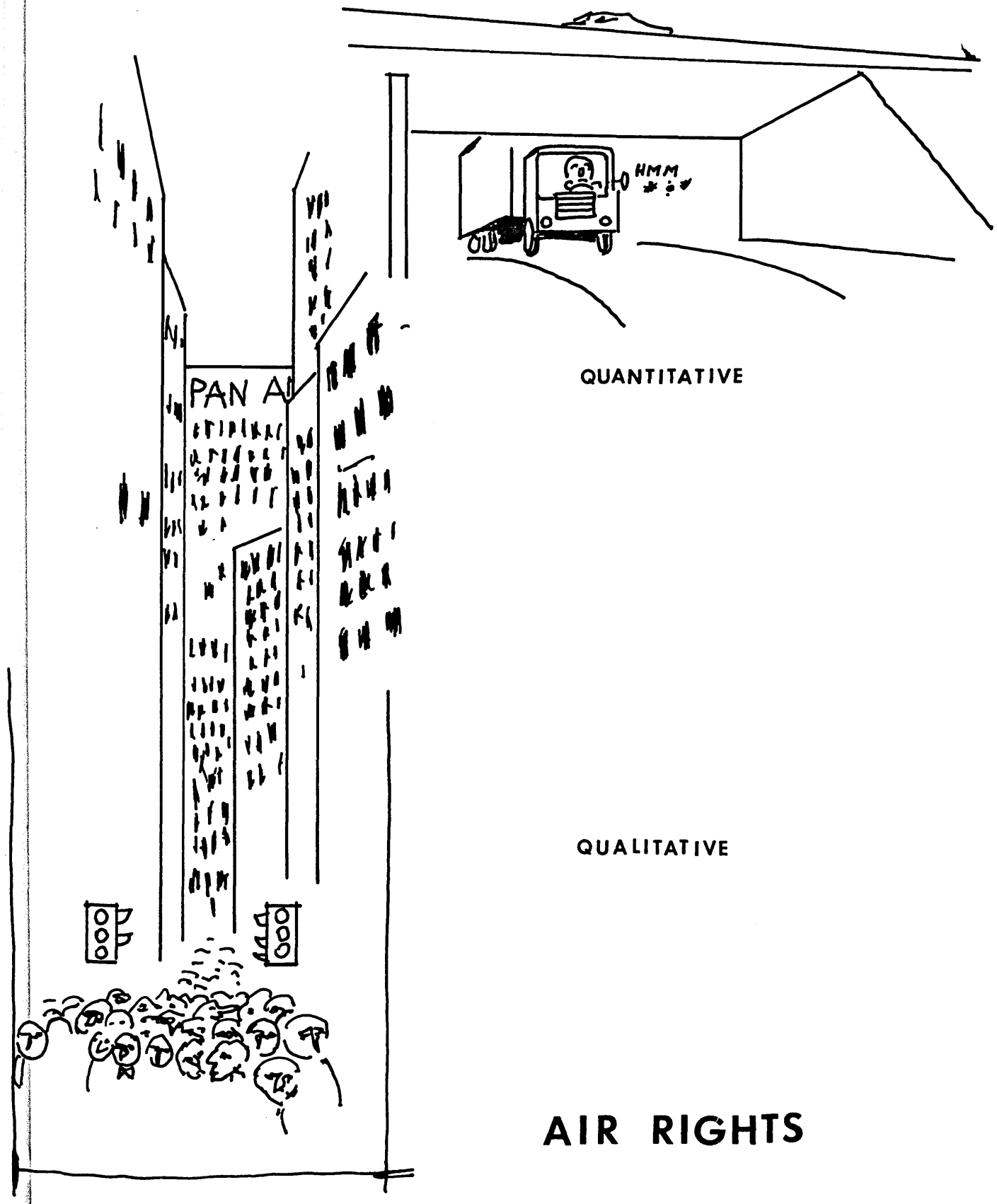
While the first one refers to the direct space around an element necessary for the physical and functional success of its activity, the second one refers to the indirect spaces around an element necessary for its visual and experimental success.

The most outstanding difference between these two air rights is apparent in their designation. The first one is measured in quantities. Example: height in feet necessary, foot-candle requirements for light, etc. The second in qualities. Example: the dramatic sense of the space, the play of light, etc.

The two kinds differ also in the approach the designer has to take to study them. The direct qualitative air rights can be studied statically by simple measurements and dimensions using very simple means such as two dimensional drawings or diagrams, while the indirect qualitative air rights have to be studied dynamically in three dimensional and behavioral models.

The general thesis I propose is that if we want to use the total urban space wisely, the first step we should take is to concentrate to the maximum the elements that need only quantitative air right spaces into one solvable package.

This is a very important notion for, thanks to our modern technology, we can actually make these packages very efficient elements. This will allow us to clear the rest of the urban scene for those elements that need more than mere dimensions for their functioning. This in a way is the approach we take in designing our individual buildings where we concentrate all our services in one central core



QUANTITATIVE

QUALITATIVE

AIR RIGHTS

to clear the outside perimeter.

On the other hand, we have to admit that by bringing together many elements for the sake of integration we may have to change our concept of some of them, i.e., we may have to somehow redesign these elements so that they keep functioning properly in the new whole.

PART II: THE ACTIVITIES

In the preceeding part, for the sake of analyzing the problem, we divided the conflict stemming from the integration of the many elements into two groups. We stated that the conflict depends to a great extent on the context of these elements; in other words, their respective activities. This new part describes a new method of categorizing the different activities into classes relevant to urban design.

There are many ways to break down the activities into classes. The Congress of C.I.A.M. in the "Charte d'Athene," for example, classified activities into four basic groups: habitat, work, recreation and circulation. This classification was taken over by almost all architects and planners and used for the design of complexes.

For general purposes, this classification is useful. Nevertheless, many different variants have stemmed from it. Le Corbusier used it for all his town planning ideas. It has the great advantage of classifying activities into clear-cut categories of uses. But it also has disadvantages since many activities can belong to one or more categories; or they might not fit into any of them. It is hard to categorize a hospital, for example, or a university. This encouraged Bardet to talk of "equipment" as another group. But the biggest disadvantage of this classification for an urban designer is that it does not say anything about what is most important for us, mainly the different forms or special requirements of the activities.

What we want to have is a series of parallel categories that somehow enable us to evaluate the characteristics of the activities and hence the shapes of the elements they imply and their allocation

in space to use as tools for the integration in the total urban space.

These parallel scales have to be formulated in such a way that any activity belongs somewhere in each one of them and that each separate scale tells us something more about the mentioned activity. The scales we propose for this purpose are 1) the amount of contact with nature one activity needs, 2) its social use, and 3) its state of motion.

1. Contact with nature is the scale that indicates to us how to organize our activities with respect to the natural elements, sun, air, vegetation, etc. What it tells us more than anything is the amount of sense of enclosure of the elements. One has only to think of the difference between a park and a parking garage to realize that the first has to be in complete contact with nature and is completely open and out of doors, while the second can be completely enclosed or indoors.

This, in spaces, is translated into negative and positive spaces respectively. Going back to our example, the park is an outdoor, open element and its space is negative; while the garage is an indoor element totally enclosed and its space is positive. Positive and negative are the two bounds of the scale between which there is a continuous progression. These bounds need defining. The highly positive space is that which has at least six opaque planes as boundaries; for example, a darkroom. The negative space is that which has only two planes as boundaries (less than two planes will be lack of urbanity); for example, the space in front of the Marseilles apartment building of Le Corbusier.

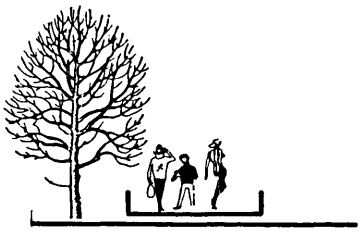
We see that according to this scale we can make specific rules for the allocation of the different activities in the total urban space in a special problem. Hypothetically speaking, the result will be in general to allocate the most negative space elements near the outside surface of our complex, and the most positive ones in the inside.

2. Social use: This second scale is the one that tells something about who uses the element in terms of hierarchies and the number of users. This may be one of the most important scales for the urban designer inasmuch as it implies in design the size of the element, and legally it establishes the sense of ownership of the elements by different persons or institutions.

Any human activity we can think of has a place in that scale that ranges from individual to community. While sleeping, for example, is a completely individual matter, shopping or mass transportation implies a contact with others.

If we consider the minimum space necessary for one person as being x for any category in the other scales (i.e., indoor, outdoor, etc.) we can work out relationships as to what amount of space is necessary for a given number of people. This in turn is translated into size of the element. The bounds of this scale are on the one hand what we call the minor urban space, as a bedroom for example, and on the other hand, the major urban space, which could be a public plaza or sports stadium.

If we consider that scale implies size and weight, we can see that this scale enables us to formulate a set of objectives for any given



IN DOOR

OUT DOOR

INDIVIDUAL

COMUNITY

STATIC

DYNAMIC

CATEGORIES OF HUMAN ACTIVITIES

problem, not only in how to distribute the users in the total urban space, but also the material.

3. State of motion: The two previously mentioned scales do not give us any way of judging shapes, which when put together give us urban forms. This is what the last scale is about. We are concerned here with only the general shapes that exist.

Our activities range from the completely static to the completely dynamic. Undoubtedly the location of that activity in this scale tells a lot about its general shape. Whereas sleeping is a completely static human activity, and that is why our bedrooms have the shape they have, driving a car at 70 m.p.h. is a completely different thing, and that is why our highways look the way they do.

As the activities go from static to dynamic, the shapes they imply go from concentrated to fluid. These are the bounds. This gives us a way of evaluating the activities we have at hand and setting some objectives.

The most important observation of this classification is that as the elements become more and more fluid, they tend to have a stronger directionality; while walking as an example is a very maneuverable way to move around, to enjoy nature, or to meet people, moving by car implies a start and a destination and as its speed increases the radius of curvature of the element has to be greater to adapt to this.

The only general objective we can make as far as this new classification is concerned is that the activities that have a low speed have to be located in our total urban space where they can be used to the utmost as our means to experience and understand the whole, and that the most fluid will be located in those places where they

have an uninterrupted natural flow to them. This in general implies a priori that the more fluid the activity is, the farther away from the ground surface it has to be.

Finally, as a general example of how an activity can fit into the three mentioned scales, to locate it in our total urban form we can take a movie theater that, according to the first scale, is a positive element, to the second scale is a major urban space, and to the third is a concentrated object.

CHAPTER II

Chapter I was concerned with analyzing the context available, (the urban space), the problems arising from integration, (air rights), and the activities, into usable, workable, architectural components. Part II is concerned with stating the optimum objective in bringing these parts together into one whole, and what means we have available for that end.

The final objective is not the total use of the urban space. The final objective in any urban design problem is to integrate the activities functionally and hence the elements spatially to form one intra-related, ordered and articulated urban whole (physical form).

Consequently what we have to do is see what means we have to relate, order and articulate the activities functionally and the elements spatially.

PART I: TO RELATE

1. Functional Relation

We define functional relation as the interaction of one activity in another activity. This implies some access or connection between them. As a corollary then the two activities have to be relatively in the same context or the same level of hierarchy.

The different ways of relating two activities functionally are the following:

a) No separation. When two activities are in the same context, and there is a complete freedom is going from one to the other with no physical barrier. Example: A plaza with shopping arcades around it.

b) Controlled access. When two activities are in the same context and there is a controlled liberty in going from one to the other, that means there is a controlling membrane. As an example, this membrane could be a wall between two activities with doors in it.

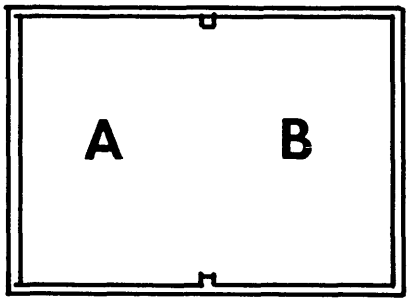
c) By mediator. When two activities are connected by another activity and to go from one to the other one becomes somehow involved in the activity of the mediator. As an example, two buildings connected to each other by a plaza, to go from one building to the other you become a participant in the activity of the plaza.

d) By link. When two activities are connected by a very controlled element, whose sole function is to connect. Corridor, tunnel, elevator shaft.

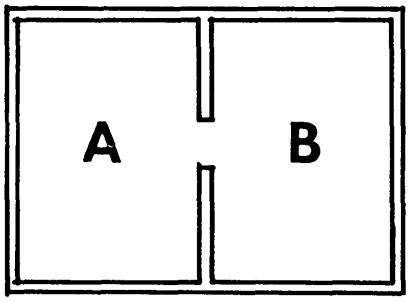
All these elements have a place in urban design. The notion I would like to formulate is that the first three are poor relating elements as far as the vertical movement is concerned as they cannot relate more than, say, three levels up and three levels down, while the last, the link, is the only truly vertical relating element, in the form of an elevator or whatever new mechanical element we have at our disposal.

This is the differentiation I would like to make at this point. If we have a plane to which we want all things to relate, the distance of the elements from it will depend on what kind of relation they should have with it. This seems to suggest that the vertical distance of things from such a "Piano Nobile" fall into two categories: one very small which we call surface contact, and the other can be very high, which we call point contact.

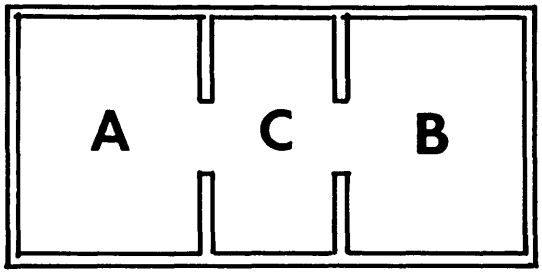
Going back to our activity classification, the general objective



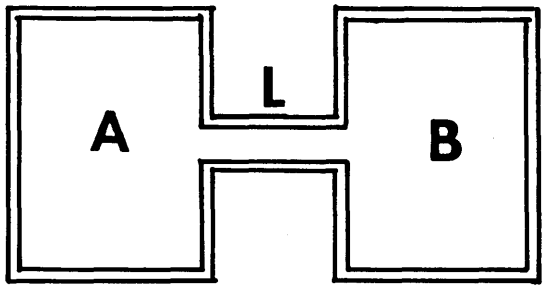
NO SEPARATION



CONTROLED ACCESS



MEDIATOR



LINK

FUNCTIONAL RELATION

I want to formulate is that activities that are consecutive in some scale should be related by "no separation," and the ones that are not by a mediator or a link. The goal is to have the urban space as continuous as possible.

2. Spatial Relation

We define spatial relation as the spatial visual interaction of one element with another. This establishment of dialogue implies some kind of common visual denominator. As a corollary then, for two elements to be related spatially in the static sense, they have to be in the same field of vision; while for them to relate to each other in the dynamic sense, they have to pertain to the same dynamic visual structure.

The different ways of relating elements spatially are the following:

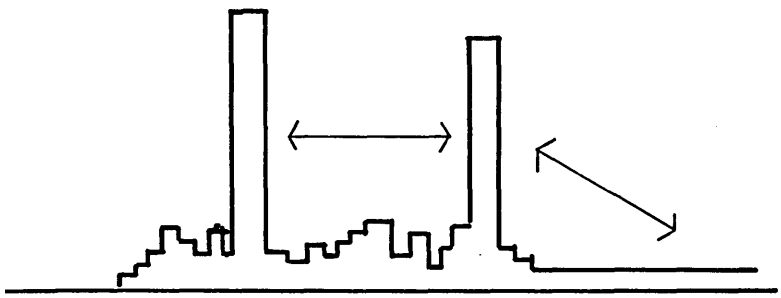
a) Common scale. When two elements are similar to each other in size. As an example, two high buildings relate to each other. So do a big building and a big plaza in front of it.

b) A common shape. When two elements have some similitude in shape. As an example, the Kresge Auditorium and Chapel relate somewhat to each other, while the Student Center, although in the same context, does not.

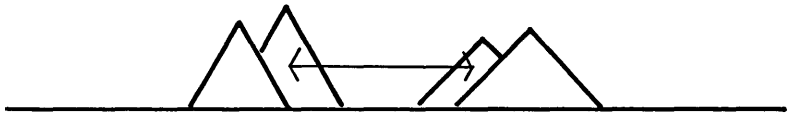
c) A common directionality. When two elements have major axis in the same direction. As an example, the Baker House dormitory and the Charles River.

d) A common aspect. When there is a similitude in the color or pattern of two elements.

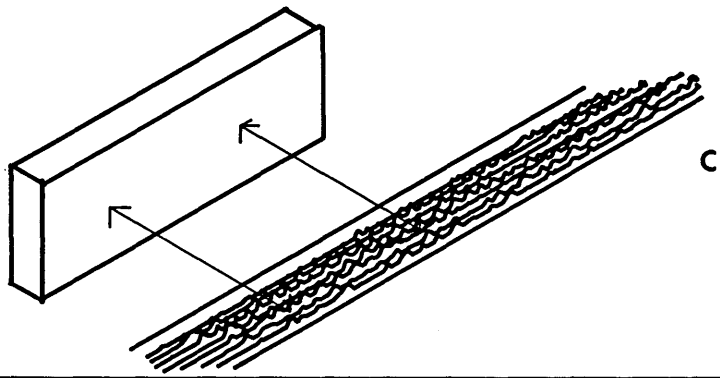
e) By contrast.



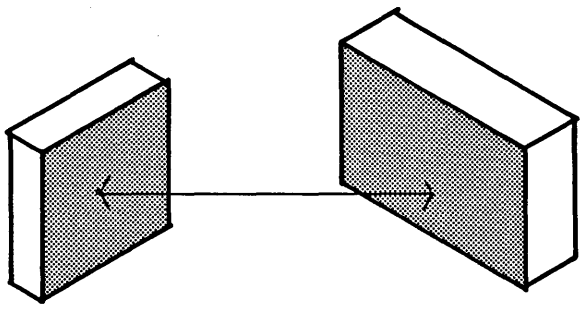
COMMON SCALE



COMMON SHAPE



COMMON DIRECTIONALITY



COMMON ASPECT

SPATIAL RELATION

In the total use of urban space, the most efficient way of relating elements spatially is by common scale or directionality. Relation by shape and aspect are too insignificant to be considered as a real tool.

PART II: TO ORDER

One of our most important aims as urban designers, we said, is to order the activities functionally, and hence the elements spatially.

We define the process of ordering as organizing things, subordinating them to a common rule or ruler.

To order the activities functionally then, there must be either one activity acting as a generator to others, like the activity of sea bathing for instance in Rio de Janeiro, where it vitalizes the whole copacabana sector, or an agglomeration of small activities that have something in common around which all the others are generated as in the neighborhhod of a "new town" where all the activities that are public are brought together to form a nucleus around which everything else revolves.

In that sense I think that when in an urban design project there is no one strong activity that can act as a generator to the others, the designer has to make an artificial generator by bringing together small activities that have some common denominator.

The problem then is to see what activities of our urban structure are suitable for the above mentioned end. In other words, what I am interested in is finding where in the three scales of the activities classification (Chapter I, Part II), should an activity be situated to be suitable for that.

It is very easy to see that the first scale does not imply anything in that respect, as the necessity of contact with nature of an element does not make it a better or worse generator. In the second scale, though, it is clear that the more public, or used, the activity is, the more suitable it is as a generator. In the third scale, the activities that are highly dynamic cannot act as generators as on the contrary they tend to separate activities, like a highway does. On the other hand, the completely static activities don't generate life around them either.

Yet some degree of motion is important as a generator. I think that the natural way of moving around (walking) is still the right mode in the dynamic scale for man to really identify himself with his surroundings in all respects. Here I mean walking as a speed. In other words, the activities that act as generators are those that imply a speed of man in his surroundings at around 4 to 6 miles per hour.

One of the reasons for choosing this specific grade of mobility of man as the optimum for vitalizing activities is that it is the media for changing modes of transportation, and by being the most static of the dynamic, and the most dynamic of the static, it can truly be the medium that surrounds all elements.

So there are two elements of the scales that act as generators or urban spaces: the degree of community and the accessibility by walking.

The spatial ordinator of the elements should if possible coincide with the activities generators. Going back to our example of Rio de Janeiro, the beach that vitalizes everything around it is what orders

the elements spatially. In the case where such a strong spatial element does not exist, the complex of the above mentioned pedestrian involved activities have to be the ordinator of the elements. Today, for example, the street is the ordering element. The ordering element in the future might be the pedestrian plane, for example, to which all elements are related.

PART III: TO ARTICULATE

Finally, no matter what the urban design project is, it has to be somewhat readable to be understood. This we call articulation - mainly expressed or formulated in clearly distinguished parts.

There are two significant means at our disposal to articulate an architectural project: by rhythm or by contrast.

1. By rhythm. This implies physical boundaries that are repeated with some kind of consistency, which indicate where the elements start and end.

2. By contrast. Which implies making the elements recognizable by themselves, by making them identifiable with a different specific location or aspect.

The most significant way to articulate our urban environment is by rhythm. This rhythm should be well studied due to the fact that we have different grades of mobility and thus different ways of perceiving boundaries and objects.

CHAPTER III

With the material mentioned in this work so far, a designer can work out rules with which he can start having an image conception of his final project. This chapter is merely concerned with enumerating systematically the tools he has at hand, or let us say the elements to execute his work.

The first elements are the natural elements of sun, air, sky, etc. These elements have to be taken into serious consideration and they are generally what give the basic urban form.

The second elements are also natural elements and are equally important, although the designer has a better control over them. In other words, in general they do not influence the design as much as the previous ones. These elements are vegetation, water, etc.

Finally, the third element of urban design is the construction materials. These the designer has the utmost liberty in handling. Example: bricks, concrete, etc.

What we should generally try to accomplish in all our urban design work is to have the maximum of the first category, i.e., sun, air, using the minimum of the last, i.e., materials, and the way we design them, if we consider that materials are what usually give us the economic factor.

CHAPTER IV

CONCLUSIONS

Almost any situation or case can be analyzed according to the different components mentioned so far.

With this new categorization of activities, the three parts of urban space, the different ways of relating, ordering, and articulating the elements, and the elements of urban design, we can study any architectural design project, analyze it and after stating specific objectives, put the parts together in such a way as to fulfill these goals.

The final goal, however, can be stated as being the maximum use of urban space. The first step to take undoubtedly in that direction is to try to work out some general recommendations as to what would be the most suitable way of allocating the activities in what we have defined as being the total urban space. Let us start with the enclosed elements, i.e., the most indoor activities. These can be allocated in the underground and as we go up the scale toward the outdoor activities, the more these activities have to be allocated on the outside of the project, or at least in a place where there is no interference whatsoever on them so that air and sun exist in them to the maximum. Furthermore, if we consider enclosed elements as being in general elements that need more materials for enclosure (according to our definition) and the objective as far as materials are concerned, as stated in Chapter III, is to have the minimum of materials, the ideal is to keep the most material nearest to the center of the earth.

As far as the <u>use</u> category is concerned, the most important aim

is to keep the most vitality and hence the most people nearest to the urban plane or ground for two reasons. First, the more the volume of people involved, the more material is used and structurally, again, the minimum use of material idea becomes very important. Second, there is a very important principle of manpower saving in keeping the most volume of people involved nearest to the major urban plane. This means that in general the more the humanitarian use of the elements, the nearer to the ground they are located. This hopefully will result in one continuous plane or set of planes, to which all the vitality creating elements are related.

Following that same thought, we find that as far as the third category is concerned, the optimum speed that creates vitality is the walking speed. This is, as we have stated in Chapter II, the critical speed at which man in his mobility can communicate, stop, turn around, etc., in a completely inoffensive media. This maneuverability makes the pedestrian movement desirable nearest to the urban ground inasmuch as the elements on it can be placed according to their necessary relation to each other, and not following a high speed axis. In other words, the higher the mobility of the activity, the less the maneuverability, the higher the directionality of the element, the more separated from the biggest distribution of material the element has to be.

CHAPTER V

TEST CASE

The following material is the first part of the test case study. It states the general considerations and assumptions relevant to the taken project and how the written part is reflected in the actual design.

1. Functional Relation.

1) Our urban road system, the grid, is the only actual means of urban functional relation.

2) The elements of the grid are linear.

3) These elements in the direction of their axis act as links according to our definition.

4) In the direction perpendicular to their axis they act as bad mediators, inasmuch as they form islands instead of relating the activities. The activities are not continuous.

5) The vertical functional relation also is directly to the grid.

In short, the link is the only actual relation in our urban structure.

Objectives:

1) The surface of the earth should be continuous.

2) Every functional relation should be by no separation or by mediator.

3) The vertical relation and bridges are the only links.

2. Spatial Relation.

1) Our only spatial relationship in the urban structure in the static sense is through the grid. It is through it that elements

relate to each other, and to it that they relate.

2) The grid is the dynamic media for the dynamic spatial relation.

In short, relationship is by close contact, or non-existing.

Objective:

All spatial relation should be established according to scale, scale of objects being the most important, then by common directionality.

3. Ordinators and Generators.

1) Today the generator, and ordinator, in our cities are the intersecting linear elements of the grid. They order the elements and the spaces, and they generate vitality.

2) These elements are completely arbitrary.

Objectives:

1) The ordinator is still the line, no matter whether it is straight or curved. Because we are interested in ordering urban spaces and the way to enclose a space is with a plane generated by a line as a direction.

2) The generator of vitality is not the grid but the ground surface.

4. Articulation.

1) Boundaries: The spatial boundaries are the voids that coincide with the grid and that form islands. The functional boundaries are the dynamic activities that coincide with the grid.

Objective:

As we are interested in vitalizing urban spaces, the spatial

boundaries of these spaces and the functional ones should be the volumes that create vitality and not the voids.

2) Rhythm.

a) Rhythm in our cities is constant in dimension. It is our city block. It is suited for riding on horseback.

b) Today there are different speeds at which we travel.

Objective:

Rhythm should be set in terms of time and not distance - 3 to 10 seconds. Every means of moving around should be studied separately for a rhythm.

5. Use of Urban Space.

1) The urban air: Today the urban air is used consistently but not very efficiently. It is only considered a repetition of public, private, static activity.

2) The urban ground: Around 40% of our urban ground is used for the very dynamic activities (roads) and the rest is unusable because there is no differentiation between point and surface contact.

3) Our urban underground is very little used.

Objective:

The urban ground should be used to the utmost by pedestrians. It should have all surface contact elements on it and all point contacts related to it. To maximize surface contact and minimize point contact is also an objective. The same floor-air ratio will be maintained.

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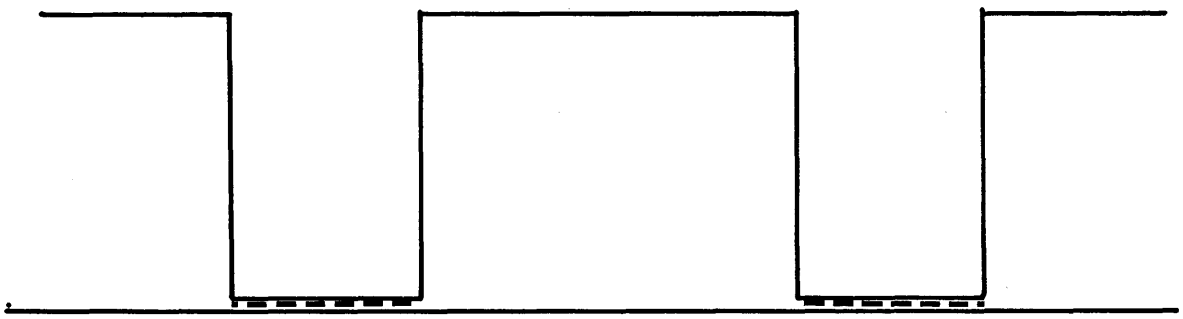

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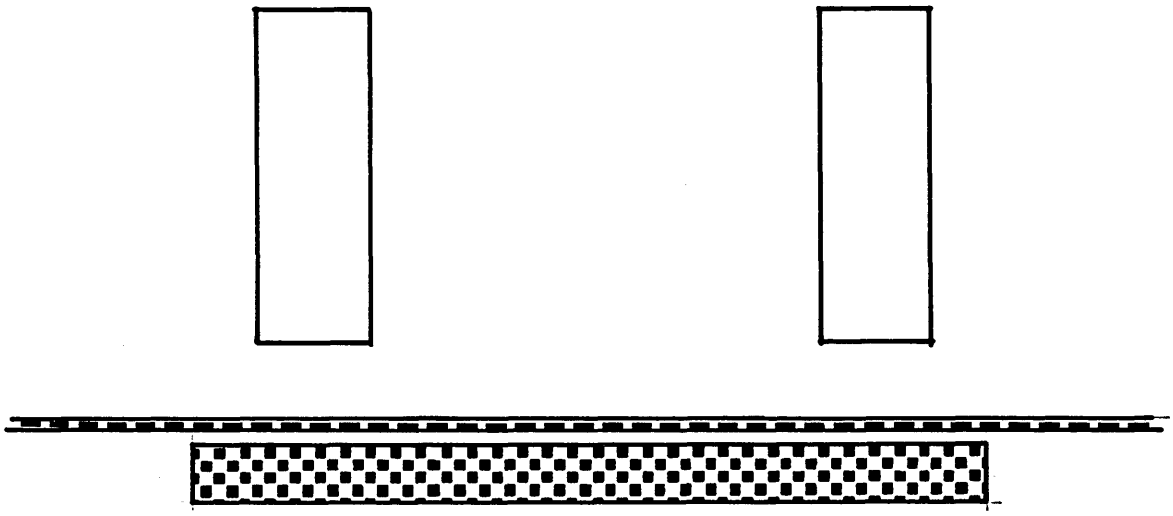

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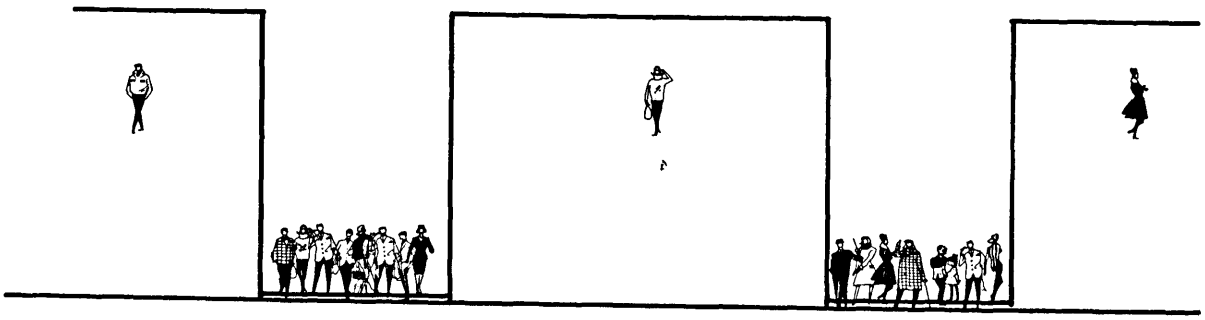

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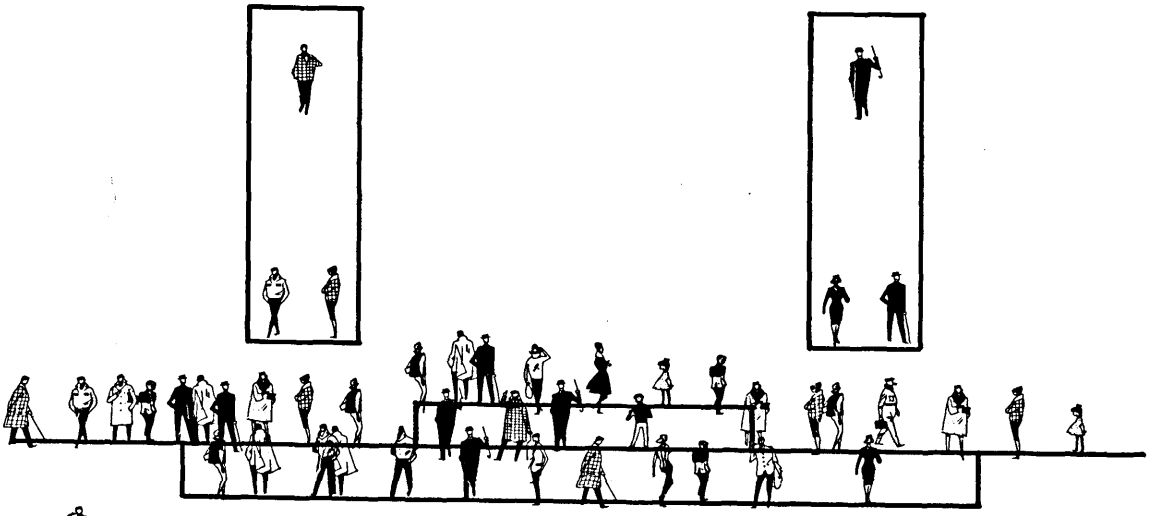

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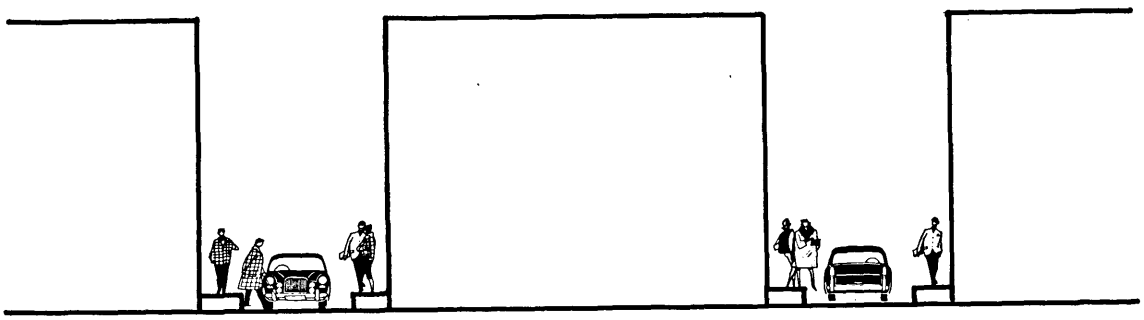

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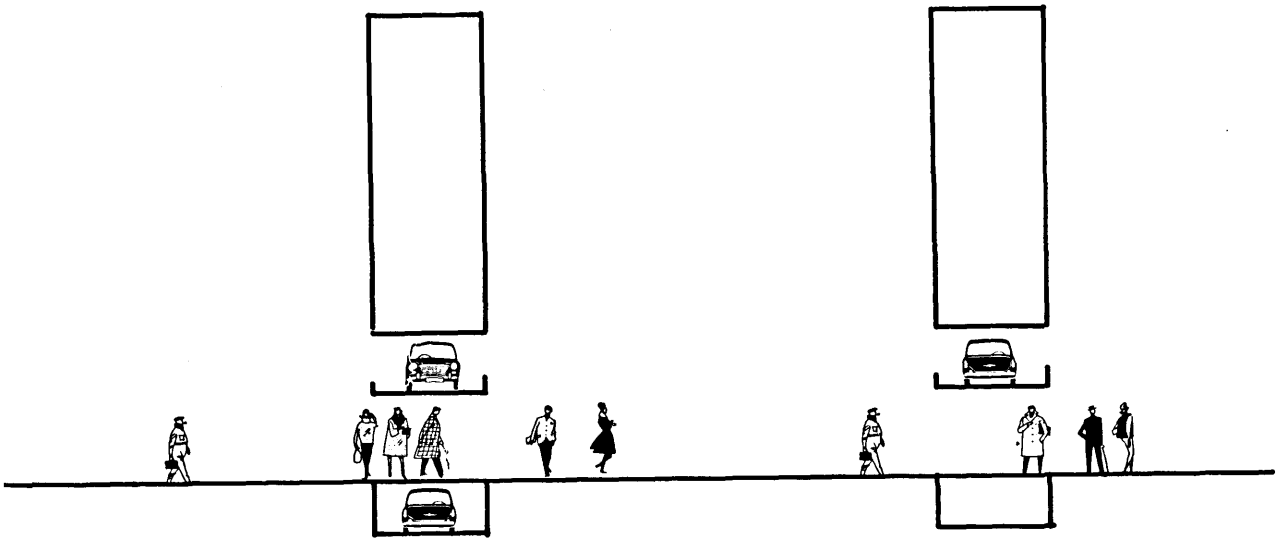

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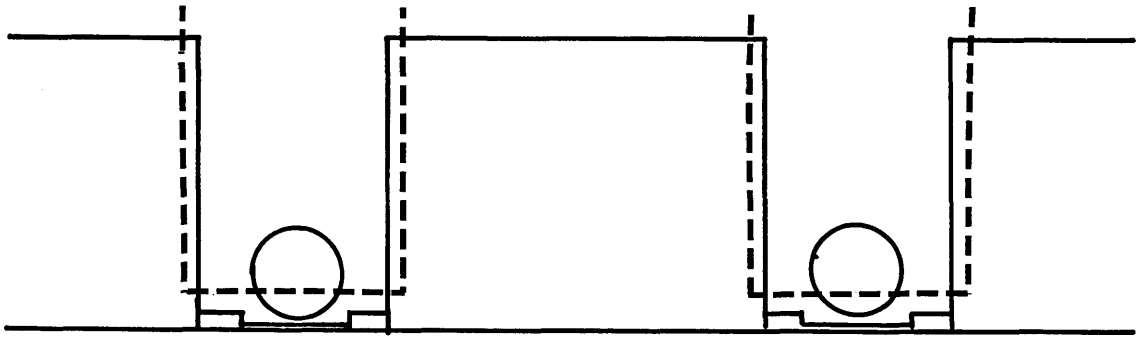

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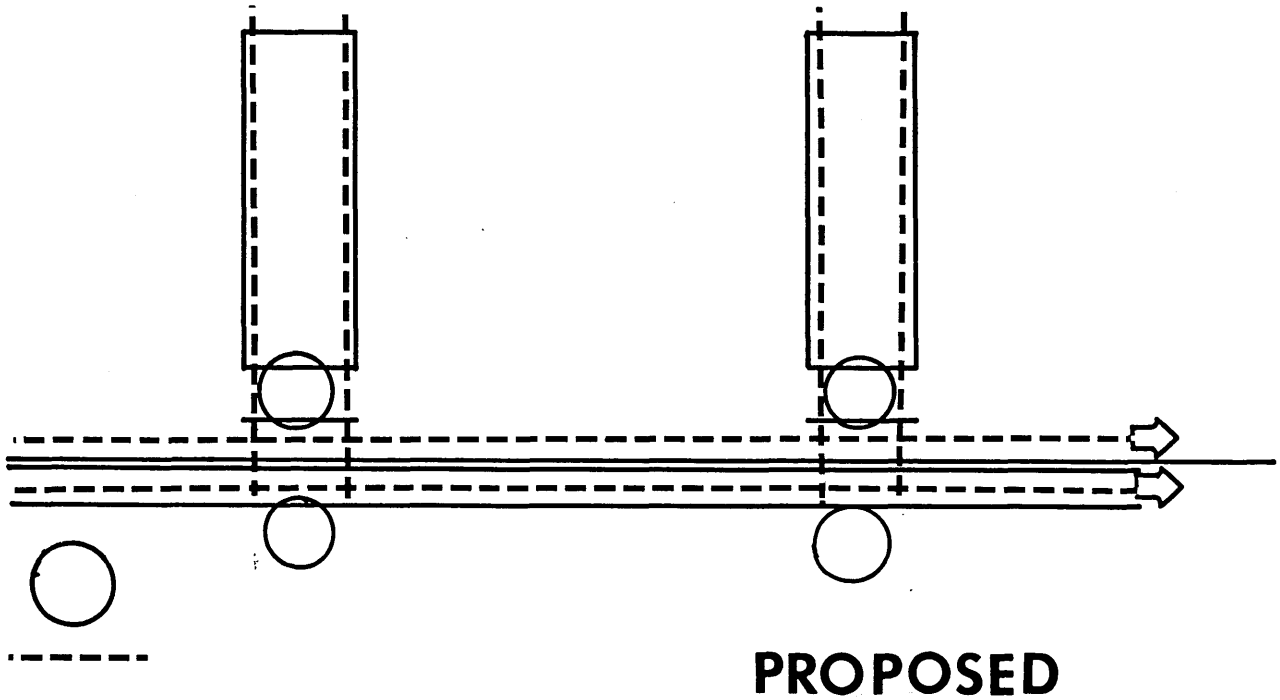

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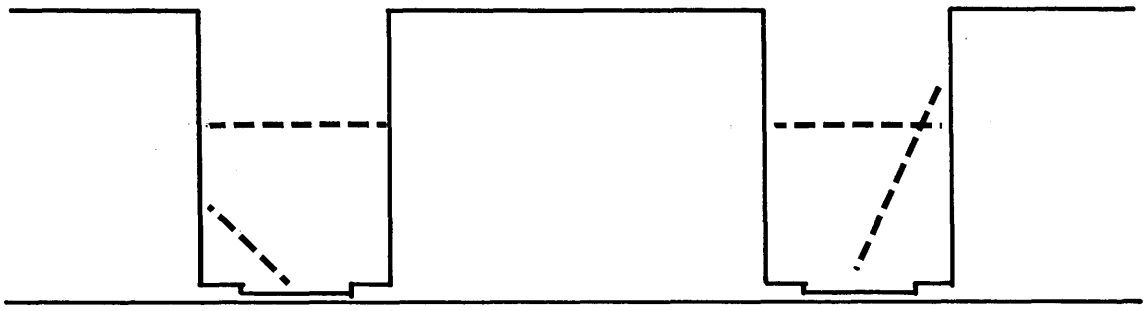

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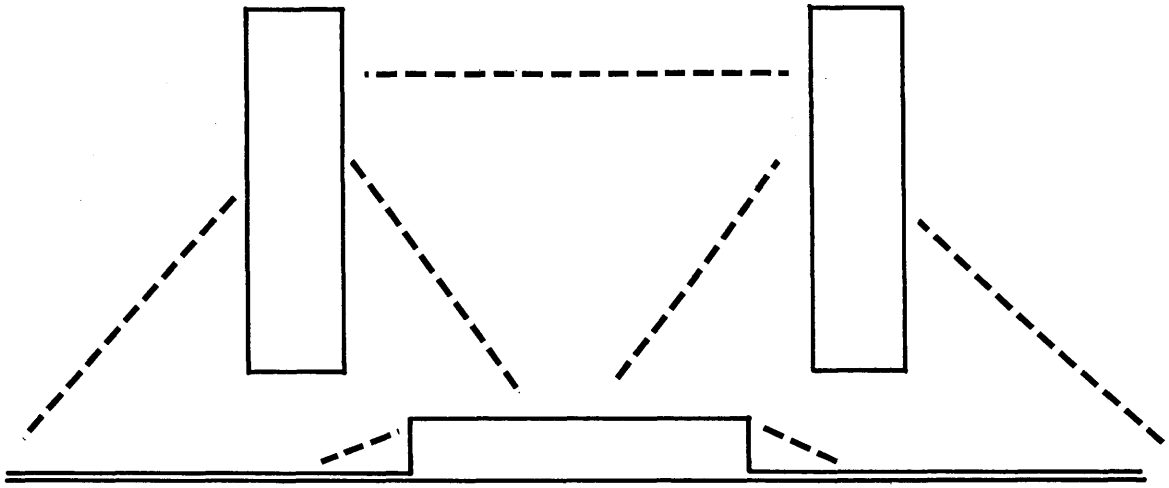

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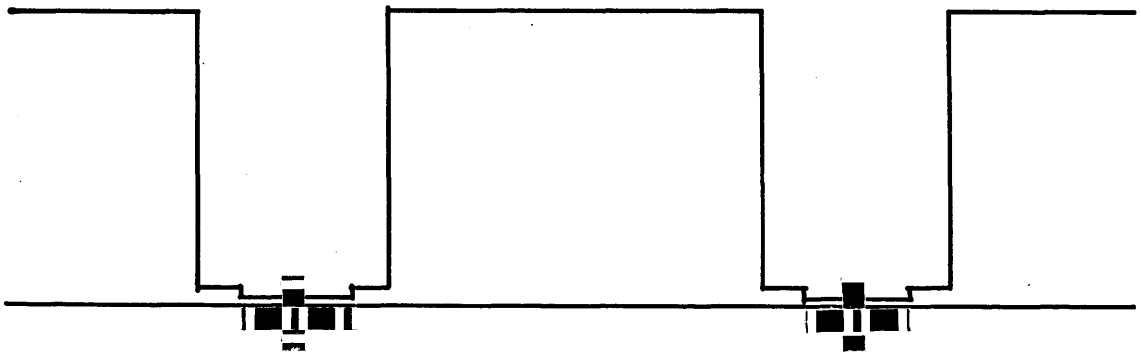

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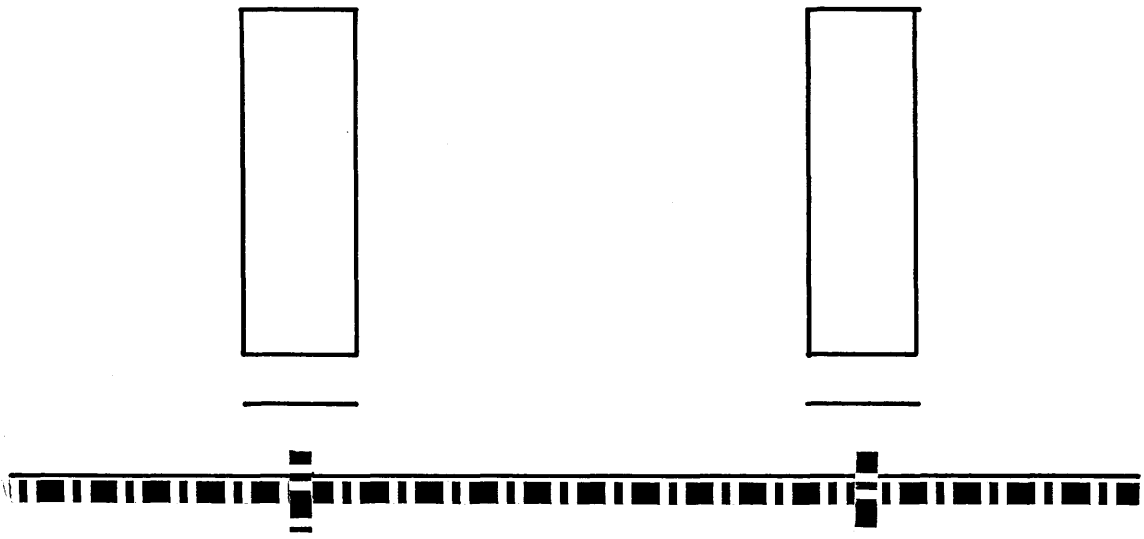

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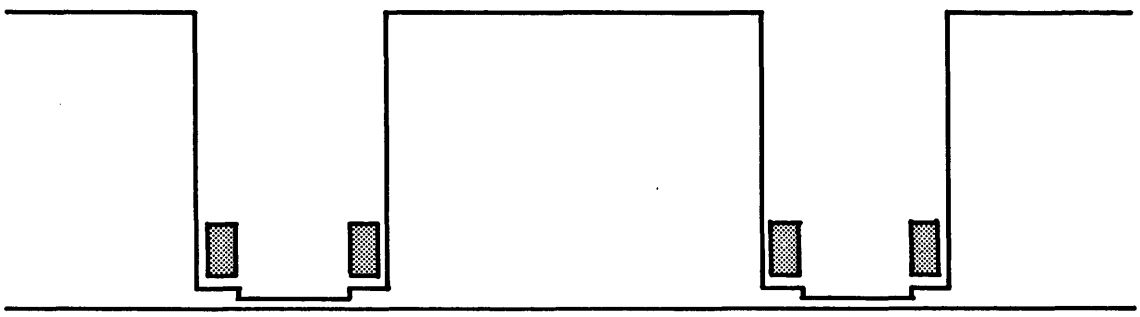

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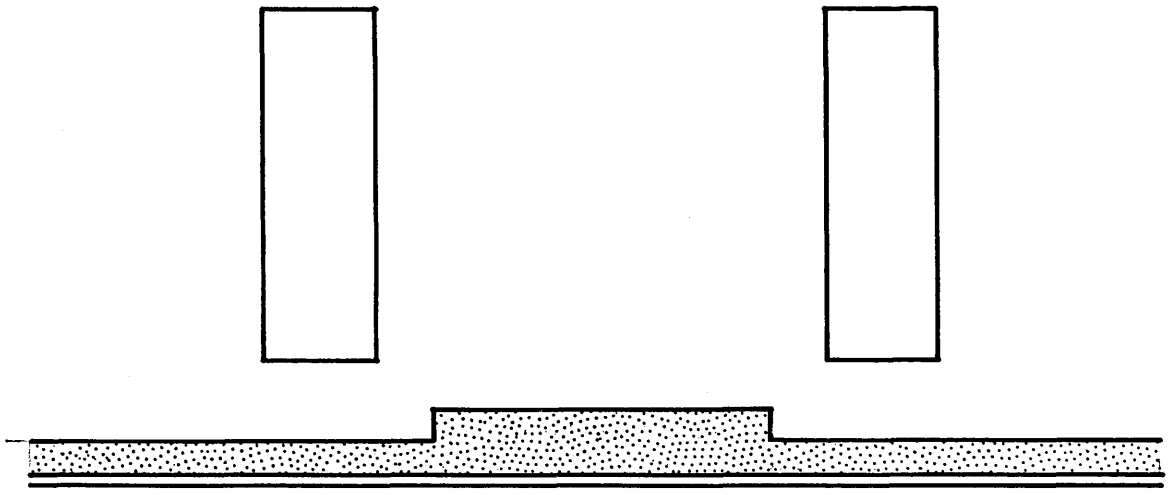

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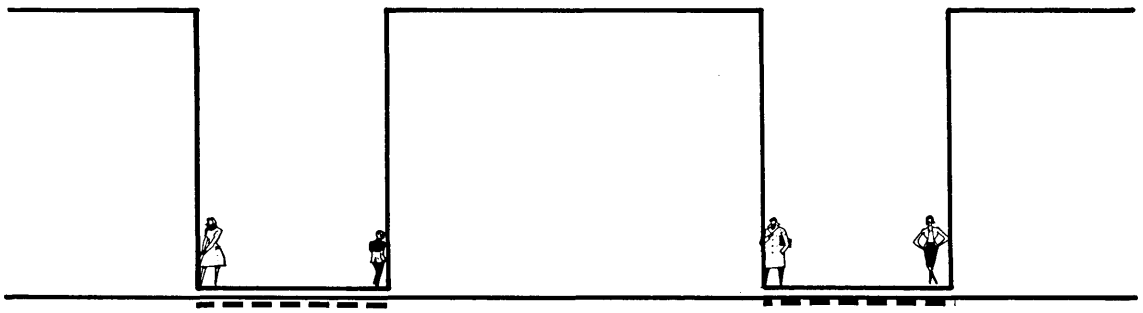

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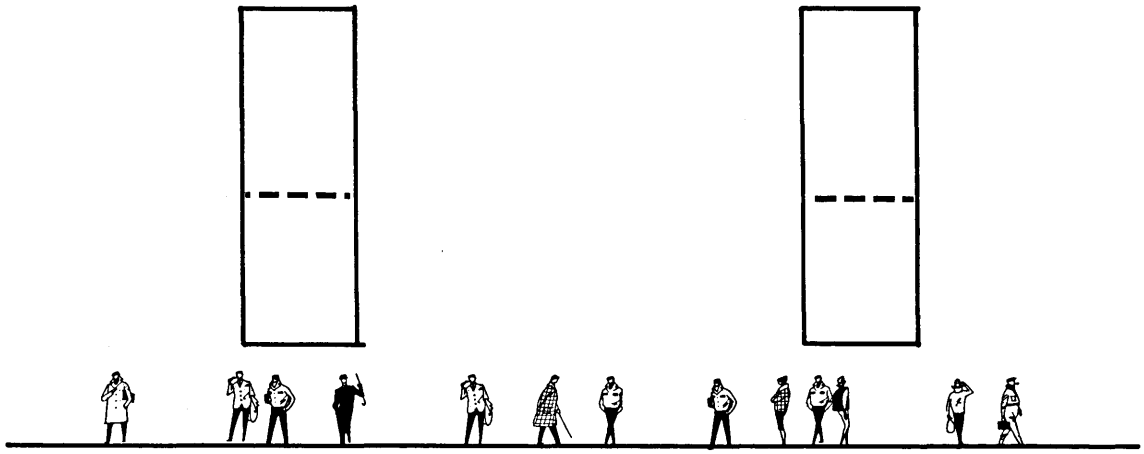

----- BOUNDARY

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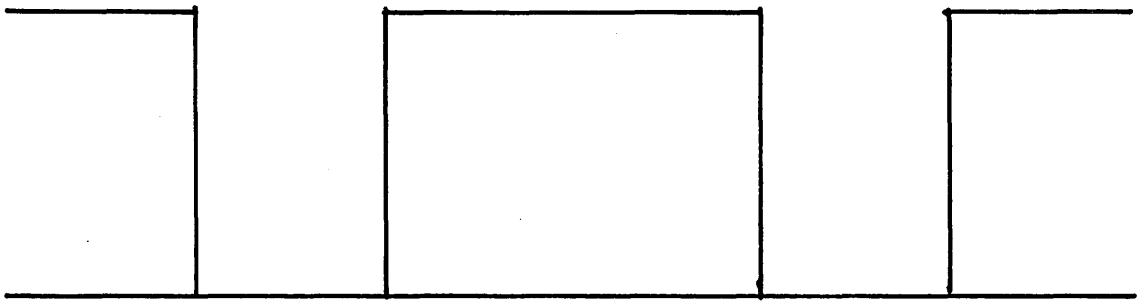
BOUNDARIES



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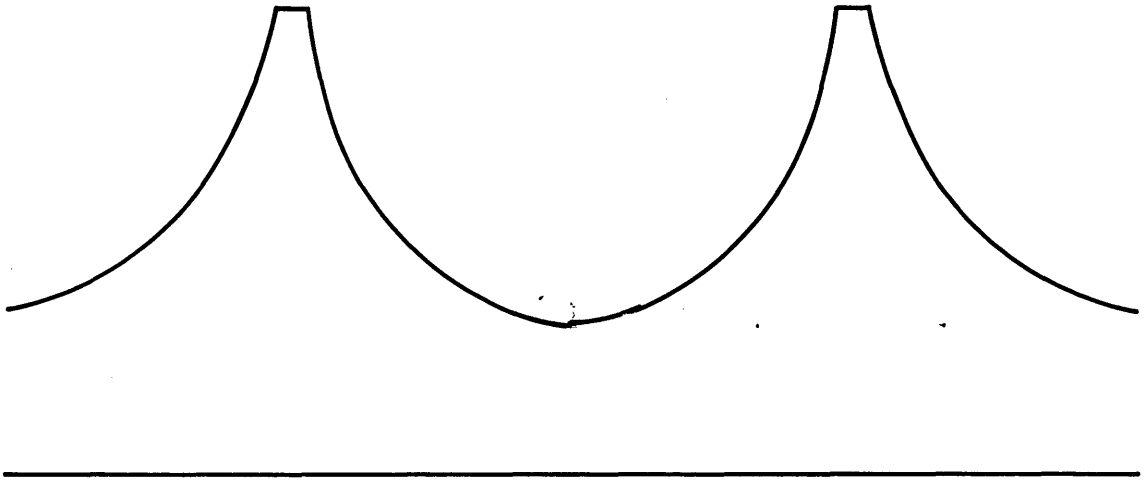

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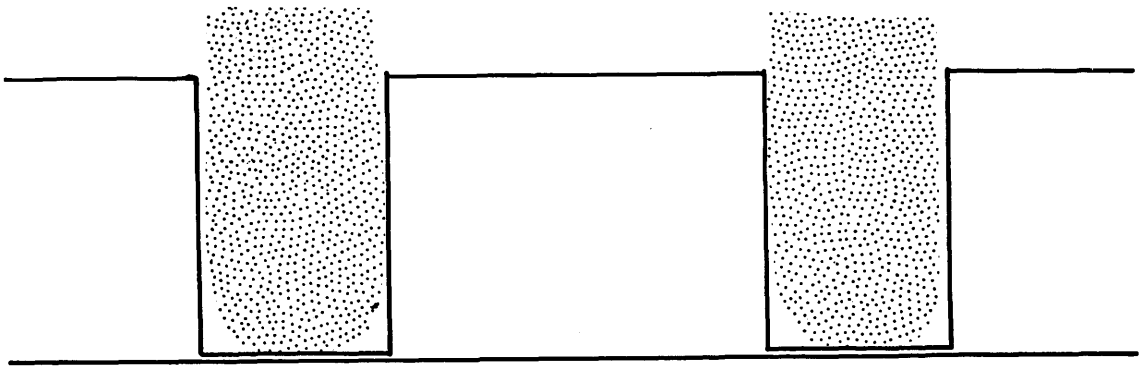

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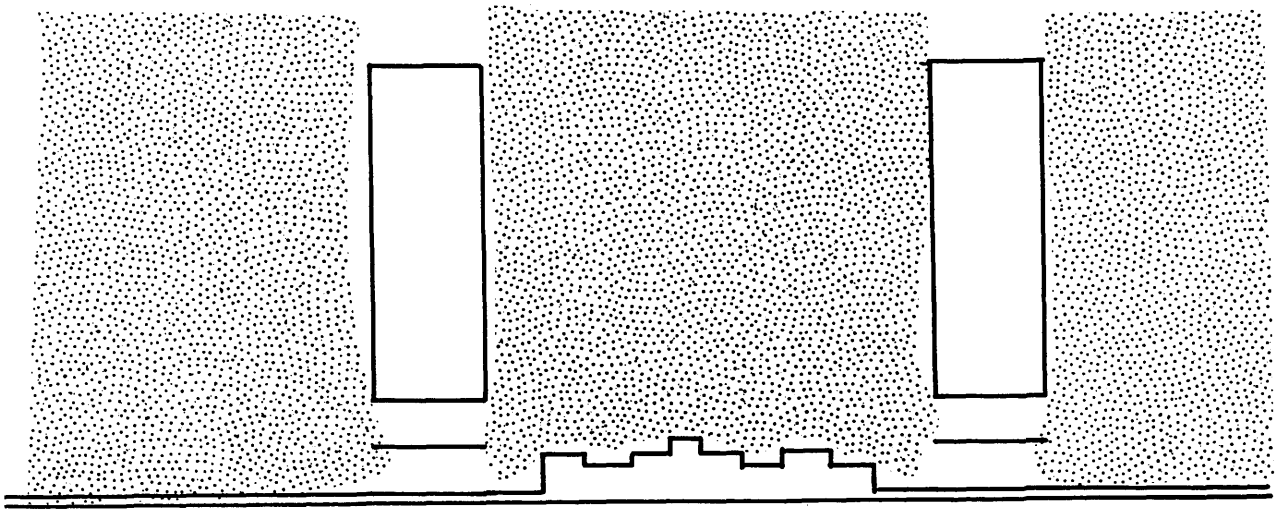

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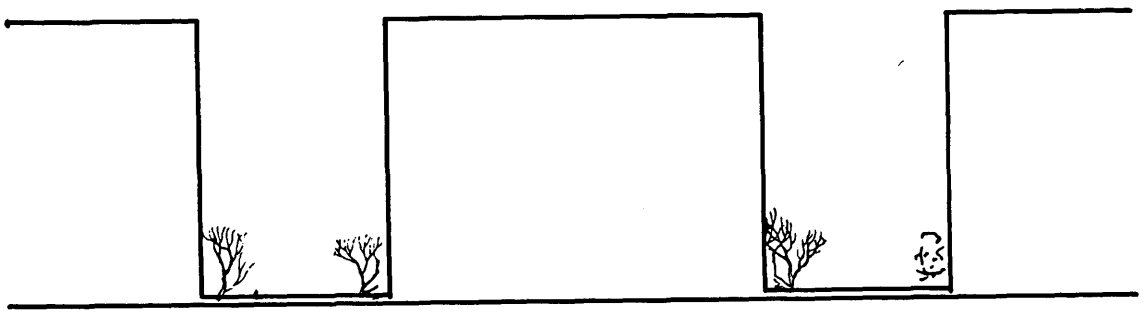

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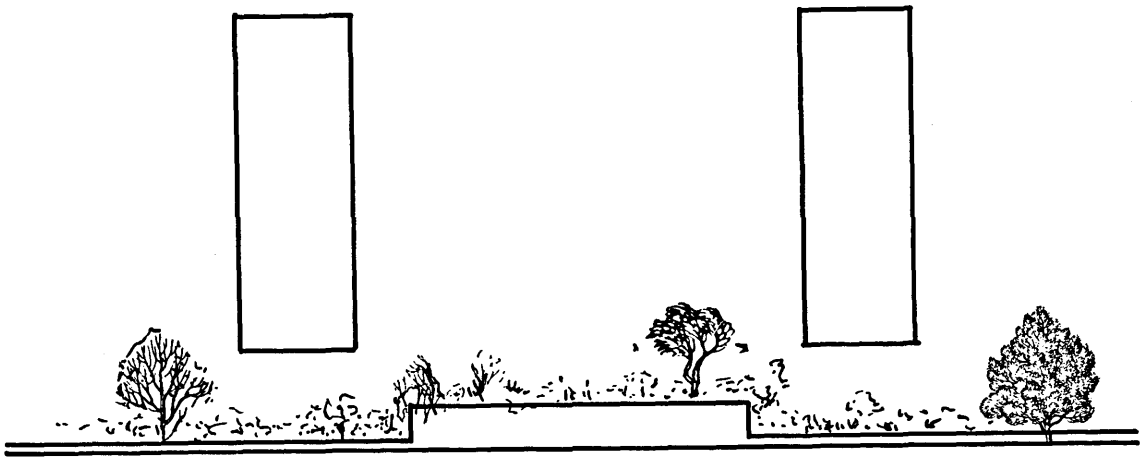

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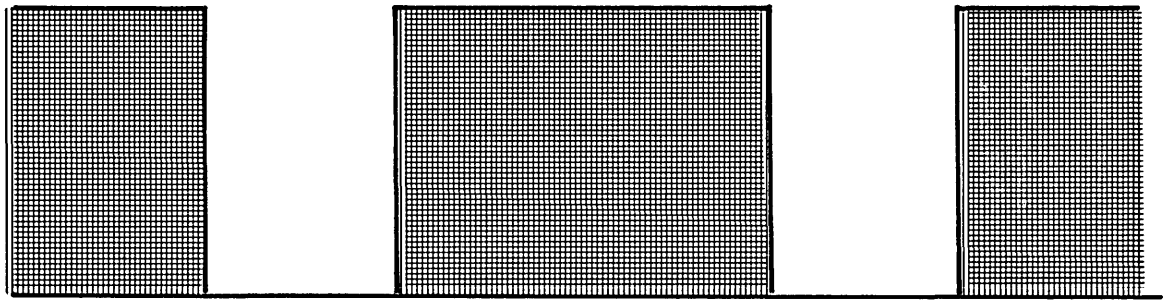

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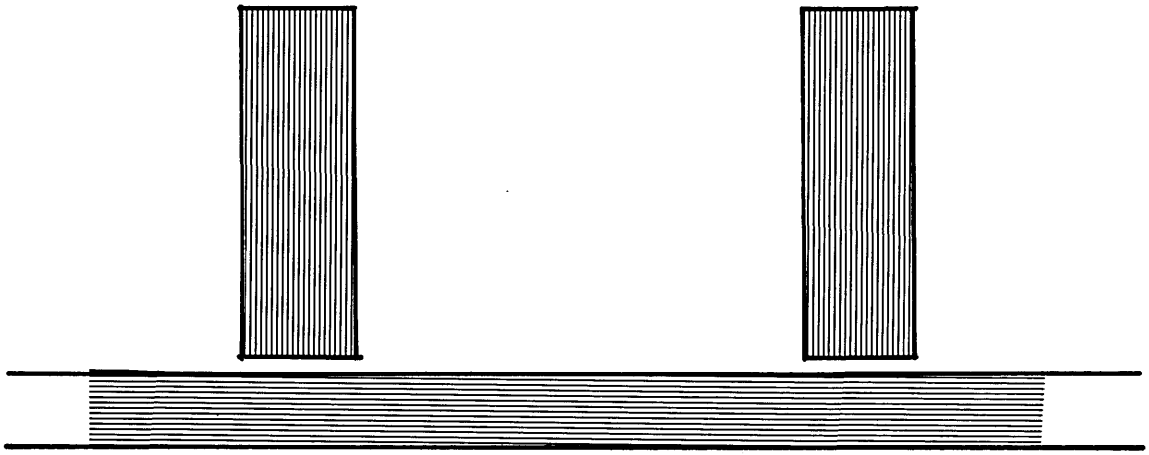

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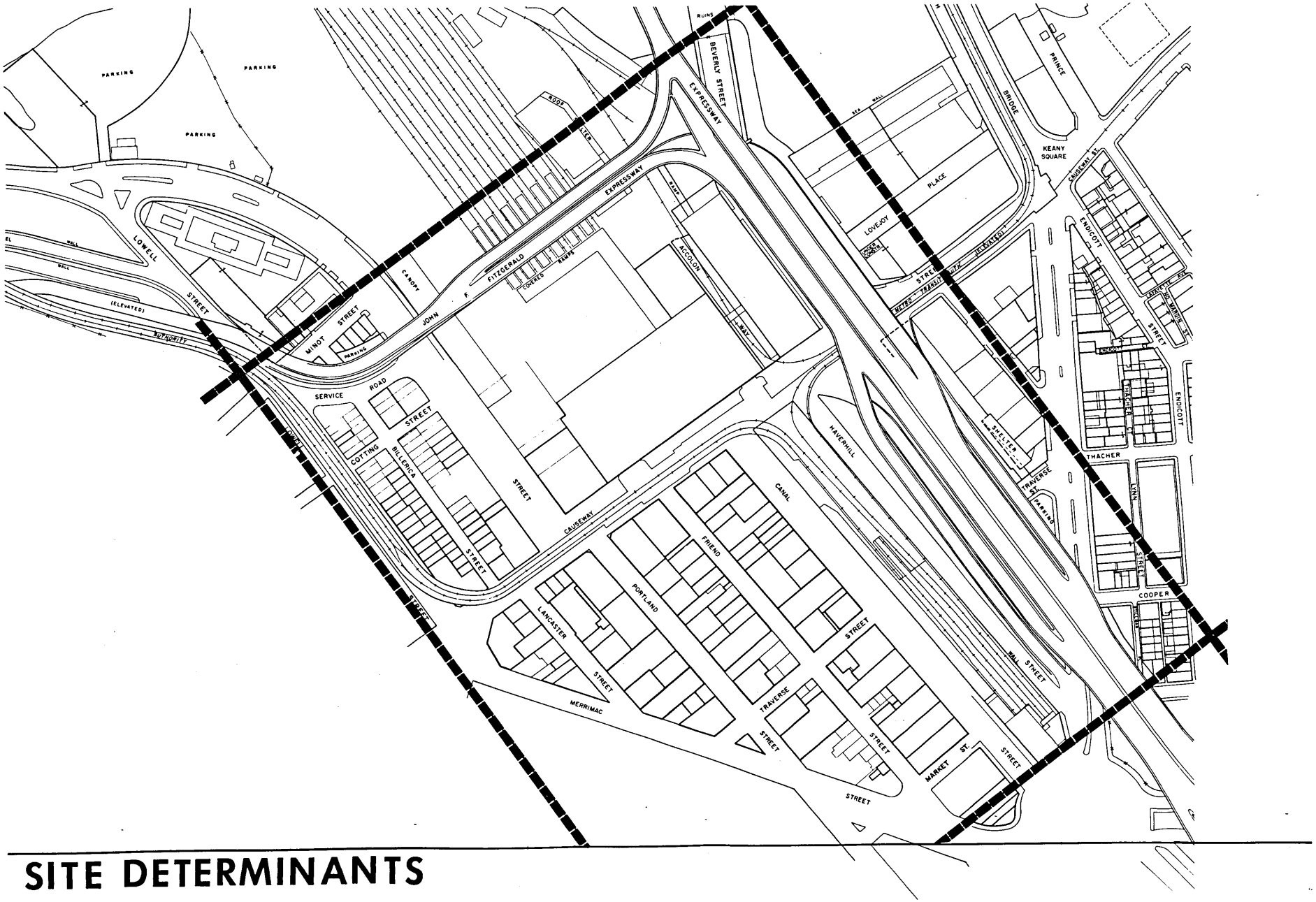

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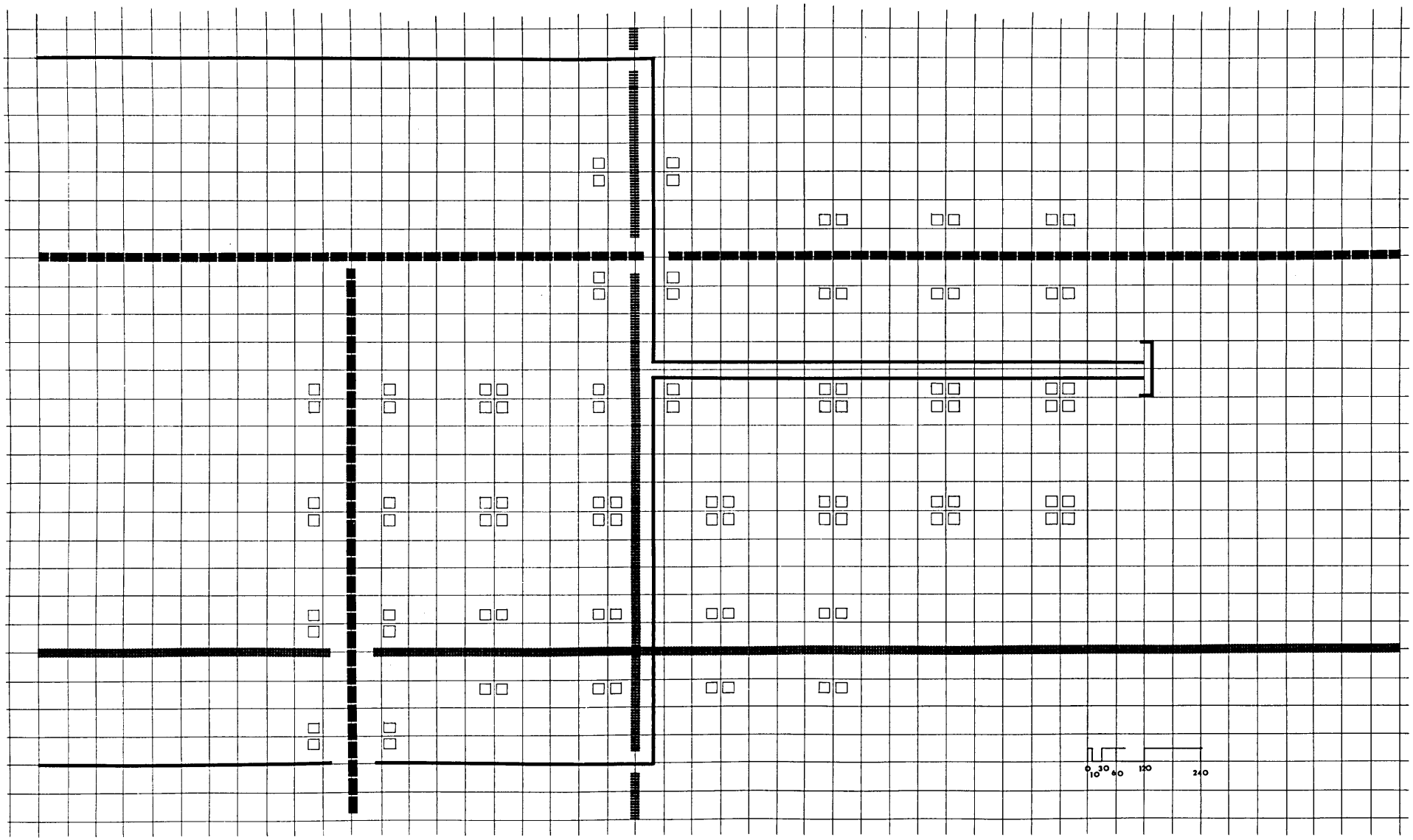
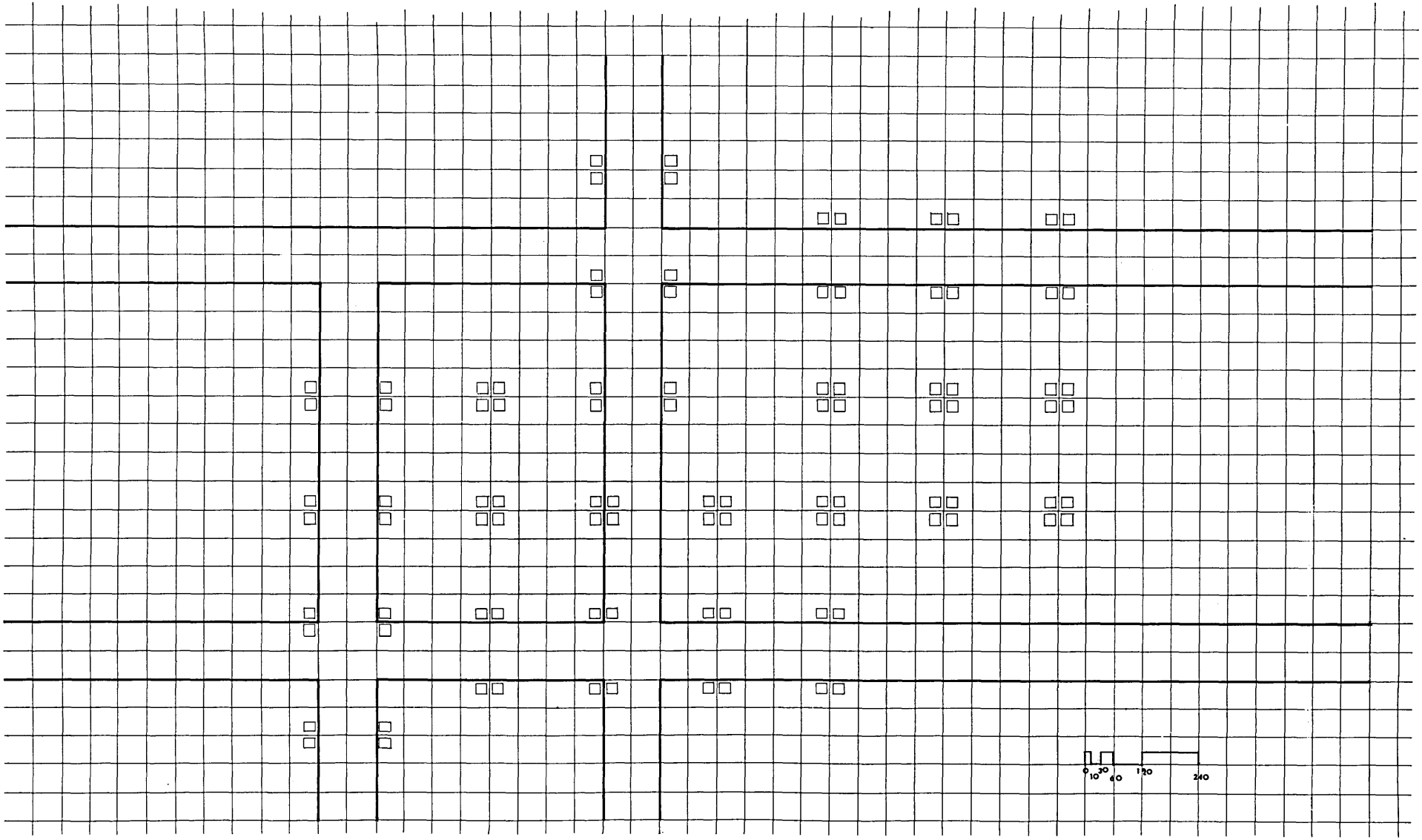


GENERAL LAYOUT

THE TOTAL USE OF URBAN SPACE
MASTER IN ARCHITECTURE _ THESIS
M.I.T. SPRING 1966 N. MANASSEH



AIR RIGHTS

THE TOTAL USE OF URBAN SPACE
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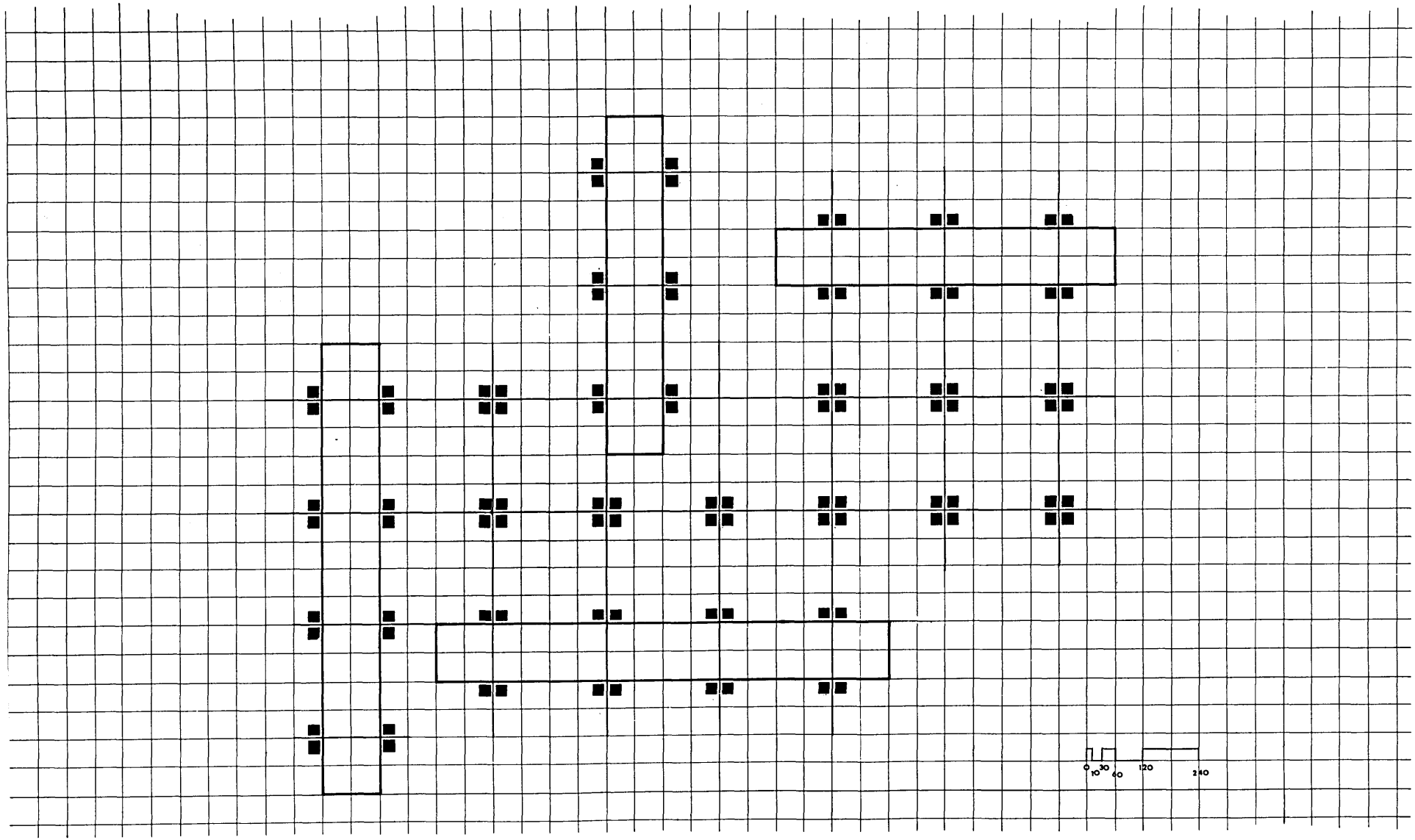

CONTACT

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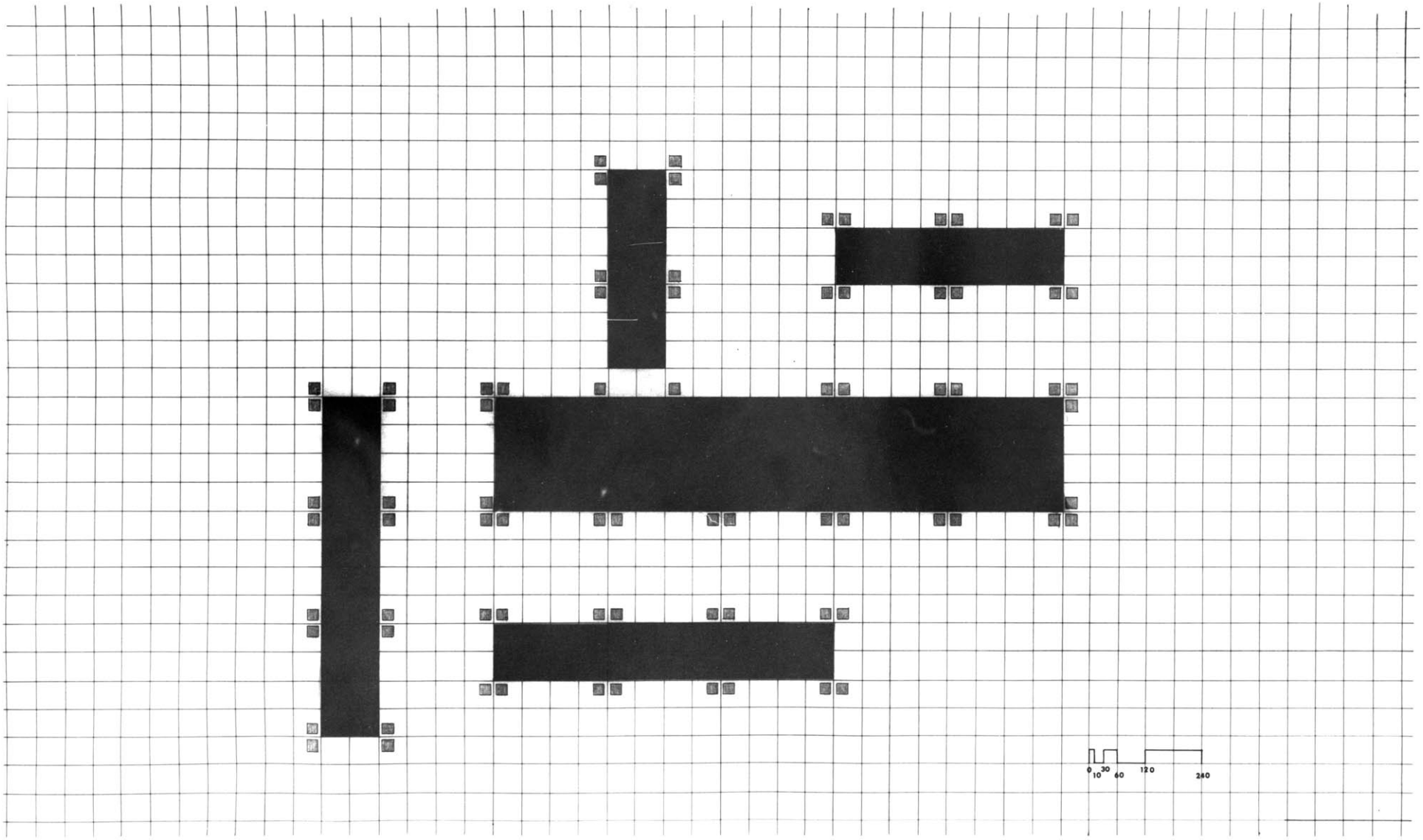

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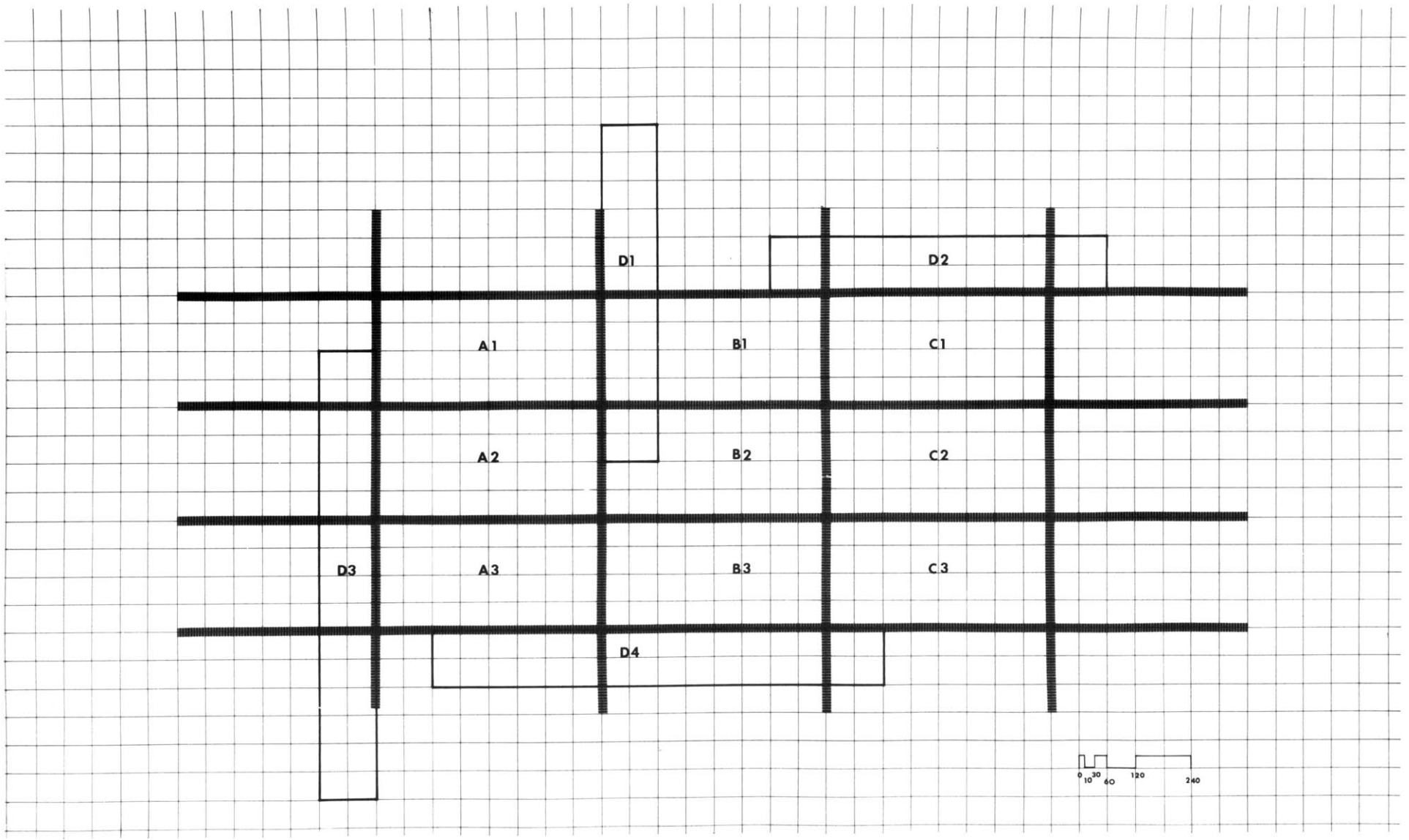

LINKS

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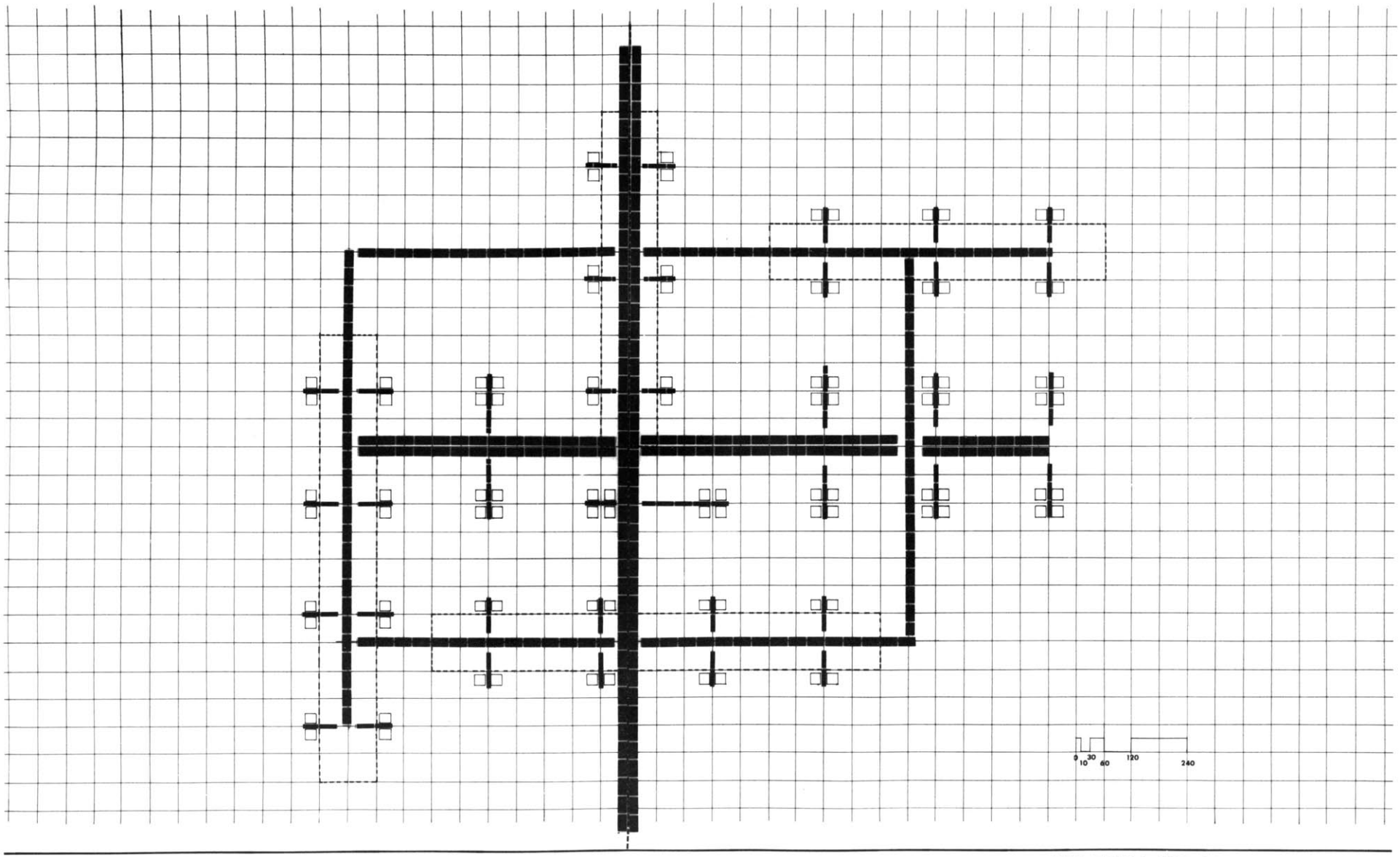

VEHICULAR ACCESS

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